

Determinants of Private Agricultural Investment in Assosa Zone, Benishangul Gumuz Region, Ethiopia (Micro Level Analysis)

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Abstract

Ethiopia is one of the leading agrarian economies and having wide resources potential to attract domestic and foreign direct investment. The objective of this study was to identify and analysis the micro-determinants factors for private agricultural investment in the Benishangul Gumuz Regional State in Assosa zone, Ethiopia. A survey was conducted on 123 agricultural investors. Descriptive analysis and econometric methods of data analysis were employed to analyze the surveyed data. The results of micro level study showed that age, access to credit, access to infrastructure facilities, access of market, bureaucratic red tape, investment incentives and agro climate factors are significantly determinants of agricultural investment in the study areas on amount of capital to invest, assume other variables in the model were constant. The results of this study also revealed that most of the problems encountered by agricultural investors were lack of commitment to invest, lack of adquate finance and institutional constaints. The intervention program might be viewed as strengthening institutional set-up and improves the micro economic stability in one hand and encourage investors to invest on the others hand. This could be done by establishing true, independent and efficient institution, through minimizing bureaucratic red tape, and eliminating unnecessary regulation so as to create access to credit, provide infrastructure facilities to the agricultural investment. The regional governments should work with investors to make conducive investment climate and open up its doors to investors by applying appropriate policies and investment incentives to achieve the long term development of the regional economy.

Keywords: Determinants, agricultural investment, Status of investment, Tobit model

1. INTRODUCTION

1.1 Back ground and Justification

The Ethiopian economy is agrarian based with the agriculture sector still having a dominant role in GDP and employment generation. Although the contribution of the sector to the national economy is high, its performance has not been satisfactory. Ethiopia attracting domestic and foreign direct investment. It is one of the fastest growing economies in the world. In 2013, the country's GDP amounted to USD 46.87 billion, with a growth rate of 10.4 percent during the year. The country has also maintained an average growth rate of 10.9 per cent since 2004. The World Bank and the International Monetary Fund forecast continued average growth of 8.5 percent in 2018 and approximately 7.5 to 8 percent over the past five years (WB, 2017). The country is endowed with abundant agricultural resource bases and like that of other developing countries' and the hope of the government of Ethiopia is that investors will bring capital, know-how, technology, and market-access to their economies. Investors could therefore act as a catalyst for economic transformation in rural areas where the Growth and Transformation Plan (GTP) of the country is a key and achieve its objectives.

Ethiopia is the second most populous country in Africa and offers untapped resources, a vast domestic market and a large, young workforce. The country is also ideal for agricultural activity, with varied climatic conditions and abundant fertile land. Recent government reforms and incentives were unlocking investment and business opportunities. More efficient bureaucratic processes related to registration, logistics and taxation were increasing the inflow of foreign direct investment, especially in the manufacturing sector. Some of the top investment opportunities were in export- oriented sectors. These include agro-food processing, textiles and garments and leather and leather products (GTP, 2014/15 report).

Investment an act of current spending for expected future return. It expands the productive capacity and plays a crucial role in the economic growth and development process in a nation. Investment has been regarded as one of the primary engines of growth. That is why almost all nations try to motivate the internal and attract foreign investment (Ambachew M.,2010). However, investment performance varies across borders and over time. Hence, what determine investment spatially and temporally remains a vital question? In the process of economic growth of countries, investment plays a crucial role to raise productivity through encouraging technological progress and promotes new techniques of production. It also plays an enormous role in the long run capital accumulation since investment increases productive capacity and creates new capital goods. Hence, as investment rates increase the rate of accumulation of capital stock will also increases rapidly (Majeed and Khan 2008).

Ethiopia has a diverse topography, wide virgin land and suitable climate which were favorable for Agricultural investment. Encouraging the private sector to effectively involve in the agricultural sector is also a

priority as it plays a key role in ensuring food security and generating foreign exchange. To increase private investment in the agriculture sector, large scale investment land have been identified and transferred to investors by federal land bank. As a result, in 2012/13 budget year 3.31 million hectare of land was identified and transferred to the federal land bank. On the other hand, in the effort of increasing agricultural production through developing suitable and cultivable land it was possible to cover 203.94 thousand hectares and 254.5 thousand hectares of land with root crops, and fruits and vegetables in 2012/13, respectively. Similarly, it was possible to cover 702.6 thousand hectare, 72.4 thousand hectare and 231.4 thousand hectare of land with stimulant crops, industrial crops and spice crops respectively, in the same fiscal year.

Benishangul Gumuz region and Assosa zone are negotiating their productive agricultural lands for long term leases to private foreign and domestic investors but due to many constraints factors, the performance of the agricultural investment were very weak and not implemented as per the land lease agreement with regional government (GoE, 2017). Different research conducted in the region on different issue but there is no empirical analysis in the academic area particularly in Assosa zone and so this study has tries to investigate the micro determinants factors and the major operational constraints of agricultural investment in Assosa zone. The main research questions are

- What are the micro- level determinants that cause low amount of capital invested and cause impediment for their progressiveness of agricultural investment in the study area?
- What are the trends of agricultural investment across Assosa zone?

1.2 Objective of the Study

1.2.1 General Objectives

- The general objective of the study is to investigate the micro-level determinants of private agricultural investment in the Assosa zone, Benishangul Gumuz region.

1.2.2 Specific Objectives

- To analyze the micro-determinants of agricultural investment that affects the amount of capital invested and the progress of private agricultural investment status.
- To examine the trend of private agricultural investments across Assosa zone.

2. RESEARCH METHODOLOGY

2.1 Description of the Study Area

The study was carried out in Assosa zone, Benshangul Gumuz regional state. The Assosa zone center is situated at 661 km North West of the capital city of Ethiopia, Addis Ababa. Assosa zone is bordered on the south by the Mao-Komo special woreda, on the west by Sudan, on the north-east by the Kemashi zone and on the South east by Oromia region. The largest town in Assosa zone is Assosa town (*Sources BoA, Benishangul Gumuz Regional State, 2006*).

The study area is characterized relatively with high plain (flat) and less mountain feature areas which is unevenly distributed within the seven woredas of Assosa Zone. The elevation of the study area has varying ranges starting from 534 m.a.s.l. low land of Assosa and Kurmuk to 2,217 m.a.s.l. at the top of the Bambasi woredas due to the presence of Abamoti Mountain nearby Bambasi town.

2.2 Data Collection and Sampling Procedures

In order to analyze the process of commercial farmland performance in term of invested capital and its effects, multilevel exploration of qualitative and quantitative data were used. Using a structured questionnaire, 123 investors were asked to fill the questionnaire and four enumerators were trained on the contents of the questionnaire and interview techniques. The questionnaires were pre-tested and on the basis of the results obtained and necessary modifications were made. The questionnaire was designed in such a way that it enables to collect data on personal farm level characteristics and investment climate factors. Major variables expected to have relation with investment decision including farm level characteristics, socio-economic, institutional and agro-climate factors were incorporated in to the questionnaire. Secondary data were collected from different published and unpublished sources in concerned authority. The lists of agricultural investors were obtained from the Benishangul Gumz Regional State Investment offices and woredas land administration office. Federal and regional level commercial farm performances report were one of the main secondary sources in this research

Stratified sampling technique has an advantage in some cases, more accurately reflecting the characteristics of the target population than others sampling method. In this study, the individual investor is actually responsible for making decisions on their investment activities. Thus, an individual investor was the basic sample unit. To avoid problem of bias and to represent each stratum stratification based on woreda and investment status group proportional sampling technique was used.

2.3 Sample size determination

An individual investor is the basic sample unit or unit of analysis. Among 757 private agricultural investors in the region, 177 agricultural project founded in Assosa zone. The study adopted the formula suggested by Solomon (1996) for determining sample size.

$$n = \frac{N}{1 + N(e)^2}$$

Where, N is the total agricultural investors in Assosa zone
n is sample size include in the study

e is the error margin of 0.05, the sample size was calculated as follows.

$$n = \frac{177}{1 + 177(0.05)^2} = 122.7 \approx 123$$

Based on the above equation, 123 agricultural investments project were taken as samples in this research study. The distribution of agricultural investors and their sample size per woreda indicated in figure 3.2.

2.4 Methods of Data Analysis

2.4.1 Descriptive Analysis

The studies were used descriptive statistics for analysis. Using descriptive statistics enables one to compare and contrast different categories of the sample units with respect to the desired characteristics. These analyses helps to identify the variables that influence the amount of capital invested for agricultural investment. In descriptive statistics including frequency of occurrence, percentages, tables, graphs and chart were used.

2.4.2 Model Specification (Tobit model)

The econometric model applied for analyzing micro determinants factors influencing the probability of invested amount of capital for investment activities using the Tobit model (Tobin 1958) is shown in equation (1). In the Tobit model the interest is to finding out the determinants factors and their impacts for agricultural investment through the amount of capital spent on their agricultural investment activities. Now we face a dilemma here: If investors had not invested capital, obviously we have no data on investment expenditure and hence it considered as censored at zero.

To analysis and determine the effect of the independent variable on dependent variable the econometric model i.e. Tobit model will be employed. This model is chosen because; it has an advantage over other models such as (Linear Probability Model, Logistic, and Probit) which is more related to the characteristic of the dependent variable those value was limited (between 0 to positive infinite) that reveal the amount of capital invested in the farm from pre- implementation phase to operational stage. The characteristic of independent variable some were dummy, continuous and some were categorical. Following Tobin (1958), the Tobit model can be defined as:

$$Y_i^* = \beta X_i + u_i \quad i = 1, 2, \dots, n \quad (1)$$

$$Y_i = Y_i^* \text{ if } Y_i^* > 0 \quad (2)$$

$$= 0 \text{ if } Y_i^* \leq 0$$

Where as:

Y_i = the observed dependent variable, in this case the amount of capital invested for investment activities.

Y_i^* = the latent variable which is not observable.

X_i = vector of independent variables affecting amount of capital invested for investment activities.

β_i = vector of unknown parameters

u_i = residuals that were independently and normally distributed with mean zero and a common variance σ^2 ($i = 1, 2, \dots, n$).

Note that the threshold value in the above model is zero. This is not a very restrictive assumption, because the threshold value can be set to zero or assumed to be any known or unknown value (Amemiya, 1985).

It may not be sensible to interpret the coefficients of a Tobit in the same way as one interprets coefficients in an uncensored linear model (Johnston and Dinardo, 1997). Hence, one has to compute the derivatives of the estimated Tobit model to predict the effects of changes in the exogenous variables. The Tobit coefficients do not directly give the marginal effects of the associated independent variable on the dependent variable. But their signs show the direction of change in probability of investment and the marginal intensity of invested as the respective explanatory variable changes (cited by Nkonya, 1997). Thus, a change in X_i (explanatory variables) has two effects. It affects the conditional mean of Y_i^* in the positive part of the distribution, and it affects the probability that the observation will fall in that part of the distribution. This decomposition approach is used in this study.

1. Change in the probability of amount of invested capital as independent variable X_i changes is:

$$\frac{\partial F(Z)}{\partial X_i} = f(z) \beta_i \sigma \quad (3)$$

2. The marginal effect of an explanatory variable on the expected value of the dependent variable is:

$$\frac{\partial E(Y_i)}{\partial X_i} = F(z) \beta_i \quad (4)$$

$$\frac{\partial X_i}{\beta^i X^i}$$

Where, σ is denoted by z , following Maddala, (1997)

Where as: $F(z)$ is the cumulative normal distribution of Z , $f(z)$ is the value of the derivative of the normal curve at a given point (i.e., unit normal density), Z is the z -score for the area under normal curve, β is a vector of Tobit maximum likelihood estimates and σ is the standard error of the error term.

3. DEFINITION AND HYPOTHESIS OF VARIABLES

In this section, the research hypothesis and definition of variables were presented.

3.1 The dependent variable of the model

Amount of capital invested (ACI): This refers to Amount of capital invested for agricultural investment activities. This is a continuous variable but limited (left censored at zero and positive infinities) that might help to depict the preference of an investor to invest their capital on their investment activities by contributing capital, labor, time and his/her entrepreneurship ability. So in this study, agricultural investors can be categorized as who had started operation (start to invested their capital) and its value labelled as “1” and pre- implementation phase (who had not started any investement activities) and labelled as “0” for futher analysis. The potential variables that were supposed to influence investment decision in these researches were explained below.

3.2 Definition and measurement of independent variables

The study hypothesized that multiple micro variables affect private agricultural investment in the study area. The major variables that expected to have positives or negatives impact on invest capital on agricultural investment were presented and explained with the expected direction of their effect. The following independent variables were selected based on existing theories and empirical evidence from different researchers such as Bayai and Nyangara (2013), Record and Davies (2007), Baye et al. (2005)

Level of education (Educ): It is undeniable that education is an important contributing factor to making wise investment decisions as it helps to minimize investment risk. The study by Egesa (2010) indicated that skilled managers increase firm survival. Moreover, a study on private investment determinants at the micro level by Baye et al. (2005) has also shown that the level of education significantly and positively influences the probability of an individual to invest their capital. In this study, the education level considered as level of schooling attended by the investors was recorded and hypothesized to positively influence on investment decision.

Access to credit (Accred): Refers to the loans, treasury bills and other monetary instruments granted by financial institution to the private sector. It is the leading constraint for entry, operation and expansion of private investment in Ethiopia (Mitiku, 1996). Egesa (2010) also found out that the lack of credit adversely affects the survival of firms. Access of credit express as continoune variable because the amount of loan obtained from the bank recorded for analysis and it is hypothesized to have a positive impact on investment decision.

Interest rate (Inrat): There are varying views on the effect of the real interest rate on the level of private investment. Private investment could be positively related to interest rates in developing countries (Greene & Villanueva, 1990). On the other hand, a high-interest rate level raises the real cost of capital and therefore dampens the private investment level. In this study, it is dummy variables labelled as “1” if interest rates had an impact on invested capital and “0” others wise and hypothesized to have a negative effect on private investment.

Access to market (Accmakt): Several studies and economic theory have showed that access to market plays a significant role in promoting investment. As a result, in this study access to adequate market is expected to positively correlate with invested capital in agricultural investment. It is a dummy variable, which takes a value “1” if the investor has impact due to not access to adequate market and “0” otherwise.

Access to infrastructure facility (Infrstra): Several studies and economic theory have shown that infrastructure plays a key role in promoting investment. If there were adequate infrastructure facilities, more investors would be attracted to invest their capital so that it positively contributes to promoting investment status. In this study, the variable treats as dummy variable if access of infarstructure had impact label as “1” and otherwise “0” and anticipated to have a positive impact on investment decision.

Access to land (Accland): From economic theory and empirical observation, land is one of the major factors of production. The results at a micro level showed that the probability of individuals to invest their capital is significantly and positively influenced by access to land (Baye et al., 2005). The variable treats as continuous variable, because it incorporated the amount of the land size of investors and it is hypothesized that the variable has a positive impact on investment decision.

Legal and Judiciary system (Judsys): This variable refers to the respondent’s perception of the efficiency of

the legal system in terms of enforcing laws and regulations. This variable is a composite index based on four questions measuring whether or not the legal system is strong and impartial, the pace with which legal cases are treated, protection of property rights and law enforcement reputation of the legal system. The values of this index range from zero (an efficient system) to one (a non-efficient system). This variable is hypothesized to have a positive impact on agricultural investment.

Bureaucratic red tape (Bureta): It is a composite index, based on six questions, which assessed the opinions of the sample respondents about the efficiency of the government bureaucracy which is proxied by the time required to get investment license, land, construction permit, import machineries, bank loans and operation license. The values of this index range from zero (less bureaucratic) to one (highly bureaucratic). This variable is expected to have a negatively impact on investment decision.

Investment incentives (Invinc): The study at the micro level by Baye et al. (2005) showed that the probabilities of individuals to invest their capital were significantly and positively influenced by investment incentives. However, The International Monetary Fund (IMF) (Chua, 1995) takes the firm line that tax incentives do not stimulate investment significantly when they do and the cost often outweighs the benefits (cited in Barbour, 2005). Various incentives would promote investment progress by attracting more investors to invest in their agricultural investment. Thus, in this study, the variable treats as continuous variable because the study incorporated the number of machinery and equipment obtained from custom and duty free and anticipated to have a positive relation with the decision to invest.

Security instability (Seclins): is defined as the presence of conflict between objectives of investors, community and governments. A study on private investment and political instability (Busari & Amaghion yeodiwe, 2007) shows that the political environment does not significantly affect the rate of change of domestic expenditure if private investment grows faster. However, political risk or political uncertainty relates negatively to private investment. Thus, in this study, the variable treat as dummy variable labelled the value as "1" if it had an impact "0" otherwise and it anticipated having a negative relation with the decision of investors to invest their capital in their investment activities.

Agro-climate factors (Agrcli): The effect of Agro-climate condition is also found to be significant for firms in agriculture investment (Abuka et al., 2006). These could capture nature and area-specific factors affecting investment decisions to invest their capitals. Thus, for seek of analysis the variable treat as dummy variable labelled as "1" if there is an impact and "0" others wise. It is expected that the variables had significant impact to invest capital for agriculture investment and anticipated to have a positive relation with the decision to invest their capital.

Technological use and input supply (Techouse): This is describe the supply and use of farm machinery and equipments and others necessary inputs like improve seeds, chemical, research and innovation work for utilize in agricultural investment. Several studies and economic theory have showed that the effect of technological input supply and usage were also found to be significant and anticipated to have a positive relation with the decision to invest for agriculture investment. Thus, in this study, the variable treats as dummy and labelled as "1" if it had impact and "0" others wise.

4. RESULTS AND DISCUSSIONS

4.1 Descriptive Statistical Analysis

In descriptive statistical analysis for the purpose of investigating the determinants of private agricultural investment, a sample of 123 private agricultural investors were selected in Benishangul Gumuz Regional State, Assosa zone. Structured and semi-structured questionnaire was distributed to those randomly selected agricultural investors based on the sample frame. However, while checking for completeness of the questionnaire, all questionnaires were found completed. Discussion also held with some investors regarding to overview and general feature of the agricultural investment in the study area.

4.1.1 Status of agricultural investment

Table 4.1 shown that out of the total 123 respondents of agricultural investors included in the study, 99 (80 %) of them were found to be in operational status where as 24(20 %) of respondents were in the pre-implementation stage/not started to invest.

4.1.2 Gender of Agricultural investors

The study revealed that 95% of the agricultural investors in the both group were males and only 5 % were females as indicated in table 4.2. Likewise, for those in the non-started group 17 % were males and only 2 % were females.

4.1.3 Age of Sampled Investors

The study revealed that 85% of agricultural investors in both groups those ages were below 50 years with the minimum age 27 and the maximum 70 years old as indicated in table 4.3.

4.2 Results of the Econometric Model (Tobit model)

4.2.1 Multi-collinearity and heteroscedasticity diagnosis

Prior to running the Tobit model, the hypothesized explanatory variables were checked for the existence of multicollinearity and heteroscedasticity. If there is presence of collinearity between the independent variables, we cannot separate out the effect of each parameter estimate on the dependent variable. It is quite difficult to estimate accurately the effect of that variable. For continuous explanatory variables a technique of variance inflation factor (VIF) was employed to detect the problem of multicollinearity (Gujarati, 2003). R_i^2 is the square of the multiple correlation coefficients that results when one explanatory variable (x_i) is regressed against all the other explanatory variables, VIF is computed as follows: $VIF(X_i) = (1 - R_i^2)^{-1}$. Value of VIF greater than 10 and condition index greater than 30 were often taken as a signal for the existence of multicollinearity problem in the model. We do not observed multicollinearity problems in this study. All VIF are under 10. Likewise, contingency coefficients were used to check for association among the discrete variables. Hence, the value of contingency coefficients shown less than one and it indicated that there was not association among the discrete variable in the study.

In this study, heteroscedasticity was tested for all variables by running heteroscedastic Tobit model using econometric software Stata. In the case of limited dependent variable models, Maddala and Nelson (1978) as cited by Maddala (1983) showed that if we ignore heteroscedasticity the resulting estimates were inconsistent. Since heteroskedasticity results in a highly inconsistent maximum likelihood estimator, the model was tested, and subsequently corrected for heteroscedasticity based on the method proposed by Greene (2000).

- **Hetest;- Breusch-Pagan / Cook-Weisberg test for heteroskedasticity**

Ho: Constant variance

Variables: fitted values of ACI

$$\chi^2(1) = 57.87$$

$$\text{Prob} > \chi^2 = 0.0000$$

From Fig 4.1 indicated that these heteroscedasticity diagnosis tests suggest the presences of heteroskedasticity (as fitted values increase the graph more scattered and the p-value 0.0000 (less the usual 0.05 threshold) in the model. To correct the wrong estimates of the standard errors, coefficients and t-values, by default Stata assumes homoscedastic standard errors, so it takes account for heteroskedasticity. To do this the option robust used in the regress command.

4.2.2 Determinant of amount of capital invested for agricultural investment

A total of 14 explanatory variables were considered in the econometric model. The coefficients Age, Access to credit, Access of market, Access to infrastructure facilities, Investment incentives and Agro climate factor were found positively related and significantly influence where as the coefficients of bureaucratic red tape was negatively and significantly influence on invested capital for agricultural investment, others variable hold constant in the model.

Table 4.7 Marginal effects from Tobit model estimation in millions birr.

Marginal effects after Tobit

y = Linear prediction (predict)

= 14.690559

Variable	Coefficient	Std. Err.	Z	P> z
Gender	-.4238595	.35083	-1.21	0.227
Age	.0426636	.0093	4.59***	0.000
Educ	.0856007	.08125	1.05	0.929
Accred	.7019271	.1113621	6.30***	0.000
Accmakt	.3267745	.18065	1.81*	0.070
Infrstra	.5494231	.18033	3.05	0.002
Inrat	-.1193726	.16561	-0.72	0.471
Accland	.0001574	.00042	0.38	0.705
Bureta	-.2786285	.15336	-1.82*	0.069
Invinc	.1671683	.05925	2.82**	0.005
Judsys	-.0600735	.15979	-0.38	0.707
Seclins	.1046492	.18229	0.57	0.566
Agrecli	.398713	.20048	1.99*	0.047
Techouse	.0201918	.17005	0.12	0.905

Source: Own Survey, 2018

Note: *, **, *** statistically significant at 10%, 5% and 1% level of significance, Robust standard error

The marginal effect change estimation shown that age of the investors are positively and stastically significant (at 1% level of significance) affects the level of investment and it dedicates that age of agricultural investors are increase by one year, the level of investment also increase by Br 0.04% in millions, keeping other

variables on the model constant. This is due to as age increase up to certain points the investors expected to acquire more knowledge on how to use the limited resource efficiently and have a chance to exposure other social and economic activities. But as age reach a certain point especially at elder age, the probabilities to invest also decrease because it is difficult to manage these resources and reduce the amount of capital invest in agricultural investment. In fact the younger investors can participate more than older one in agricultural investment since it requires more energy or effort.

The finding shows that Access of credit is statically significant (at 1% level of significance) and has a positives impact on the amount of capital invested. Thus, investors who have a chance to access of credit are more encouraged to participate and invest in agricultural investment. As the marginal effect of the above econometric result shows that investors that are benefited in access of credit increase to invest Birr 0.70 % in millions than those investors that have not access credit keeping other variables on the model constant. Furthermore, as the access of market improves, the inputs demanded by agricultural investment easily founded and the product also sell with out much transportation and other related cost. Thus access of market is positively affects the level of investment. The finding of the study shown that access of market improve by one unit, the amount of capital to invest increase Birr 0.32% in millions and it is statically significant (at 10% level of significance), other variables in the model remaining constant. In fact the more access of market, the more to invest in agricultural investment.

The infra-structure facilities particular road was one of the main determinants factors for agricultural investment. Since most agricultural investment operated in remote area of the region, road facilites play a significant role for agricultural investment. The finding results shown that as one unit change in infra- structural improvement, the investors encourage to invest Birr 0.54% in millions in their agricultural investment. Thus infra-structure development is positively and significantly related with amount of capital to invest at 5% level of significant, other variables in the model remaining constant. Bureacratic red tape was hypothesizing to have a negative relationship and has statically significant (at 10% level of significance) effect with the amount of capital invest. As more time consumes to gain public services due to unneccesary bureacratic procedures, agricultural investors discourage and decrease to invest in millions birr by 0.28% than non bureacratic procedures keeping other variables on the model constant. Thus existence of bureacratic red tape hinders to invest for agricultural investment.

The amount of capital invest in agricultural investment were significantly and positively influenced by investment incentives. As the more investment incentives acquired to investors, the more encourage to invest capital than non users because it create finacial capacities and have capable enough to solves financial related constraints and hence encourage to invest more. As one unit increase the invetment incentives, the amount of capital to invest increase in millions birr by 0.17% and it is statically significant (at 5% level of significance), keeping other variables on the model constant. The agro climate factors especially soil has a positive impact of agricultural investment. As the soil fertility is naturally gifted or the more soil fertilities improve, the more the productivity increase and hence it encourages investing more capital. The finding result shown that the soil fertilitiy better than by one unit, the amount of capital invest in millions also increase by 0.39 % than their counterpart and statically significant (at 10 % level of significance), keeping other variables on the model constant.

5. CONCLUSION

As the result of the Tobit model indicates that the coefficients of age, access of credit, access market, infra structure, investment incetives and agro climate are positively related and statistically significant with amount of capital invested where as the coefficients of bureacratic red tape negatively related and statistically significant with the amount of capital to invest.

The research analyses shown that the accessibility of infrastructure facilities was the main problems for discourage to invest in agricultural investment in the study area. The agricultural investors also associated with lack of market linkage in their products and in puts in the region and thus cause for different unexpected cost. Most of an investment incentive given by government especially custom and duty free machinary and vechles had limited. Concerning Access of credit, some agricultural investors taken loan from banks but the majority were not benefited due to frequently change the loan police and strategies, required huge amount of capital as collateral are some of the problems explained by the agricultural investors in the study area.

As more time consumes to gain public services due to unneccesary bureacratic procedures, agricultural investors discourage and decrease to invest. The agricultural investor also associated with low productivites due to unwisely use soil fertilities and mis understanding the other agro-climate of characterstices in the study area. All the above points should have required strong attention to achives the long term objectives of agricultural investment.

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Notes

Note 1 Example; - Tables

Table 4.1 Status of commercial agricultural investment

. tabulate Status, summarize(Status)				
Status	Mean	Std. Dev.	Freq.	%
0	0	0	24	20
1	1	0	99	80
Total	.80487805	.3979154	123	100

(Source: Self compiled from Survey Questionnaire, 2018)

As indicated from table 4.1 during the survey, 20 percent of sampled investors were not started any activities due to lately received agricultural investment land and road problem existing to reach at farm site.

Table 4.2

Gender of respondents based of project status

Tabulate	Gender		
Gender	Freq.	Percent	Cum.
0	6	4.88	4.88
1	117	95.12	100.00
Total	123	100.00	

(Source: Self compiled from Survey Questionnaire, 2018)

Among the total respondents sampled round 5 percent were female agricultural investors where as the remain were male investors.

Table 4.3 Age of respondents

Summarize age					
Variable	Obs	Mean	Std. Dev.	Min	Max
age	123	42.86992	8.506468	27	70

(Source: Self compiled from Survey Questionnaire, 2018)

As indicated from the tables the mean age of sampled investors were 43 years old.

Note 2 Example;- Graphs

- Test of heteroscedasticity diagnosis

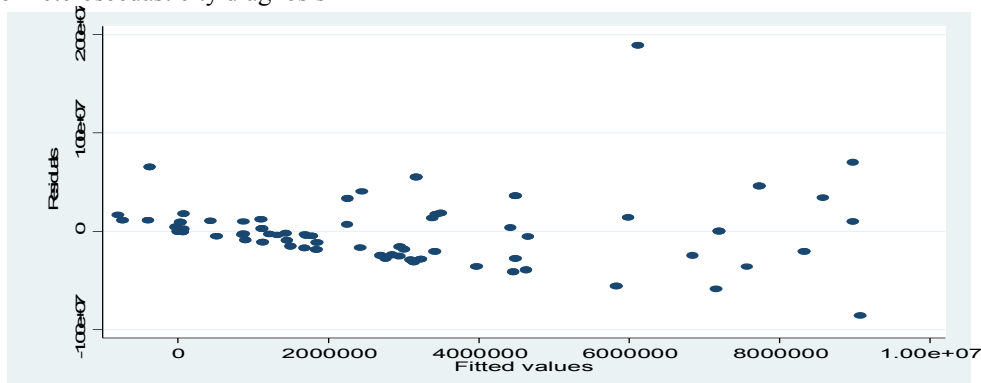


Fig 4.1 Heteroscedasticity diagnosis test

From Fig 4.1 indicated that these heteroscedasticity diagnosis tests suggest the presences of heteroskedasticity (as fitted values increase the graph more scattered).

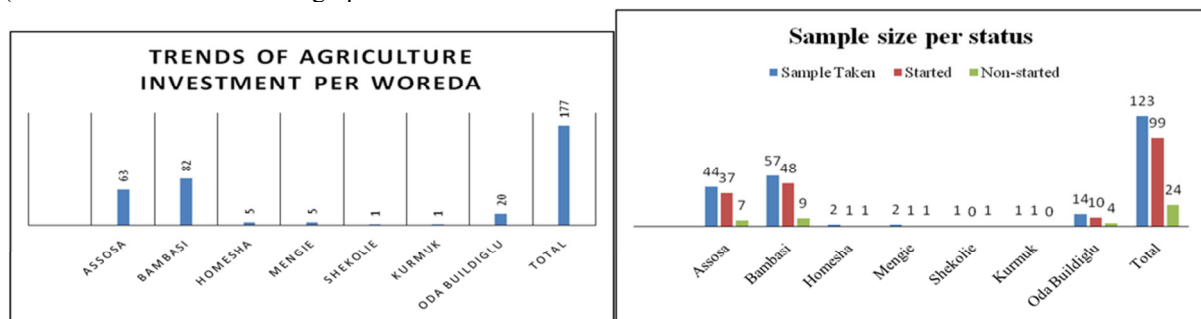


Figure 3.2 Distribution of agricultural investors and sample size per woreda

Source: Computed from survey data, 2018.

From the graph indicated that among the total 123 agricultural investors included in the sample 57 investors which is the largest numbers incorporated from Bambasi woreda where as Sherkolie and kurmuk woredas the least numbers of investors one in each woredas taken in the sample during data collection time.